Amendments to the Claims

This listing of claims replaces all prior versions and listings of claims in the application.

Listing of Claims

1. (Currently amended) A compound that comprises:

at least one ~~sialidase domain comprising a~~ peptide or protein having sialidase activity that cleaves α(2,3)-Gal and/or α(2,6)-Gal linkages; and

at least one ~~anchoring domain comprising a~~ peptide or protein that binds to a glycosaminoglycan (GAG) on the surface of ~~the~~ a target cell.

2. (Previously presented) The compound of claim 1, wherein the target cell is an epithelial cell or endothelial cell.

3. (Previously presented) The compound of claim 2, wherein the target cell is an epithelial cell.

4. (Canceled)

5. (Canceled)

6. (Currently amended) The compound of claim 3, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG can bind heparin or heparan sulfate.

7. (Canceled)

8. (Currently amended) The compound of claim 6, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG comprises a GAG-binding amino acid sequence of a naturally-occurring protein.

9. (Currently amended) The compound of claim 8, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG comprises the GAG-binding amino acid sequence of a mammalian protein.

10. (Currently amended) The compound of claim 9, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG comprises the GAG-binding amino acid sequence of a human protein.

11. (Canceled)

12. (Currently amended) The compound of claim 10, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG comprises the GAG-binding amino acid sequence of human platelet factor 4 (SEQ ID NO:2), human interleukin 8 (SEQ ID NO:3), human antithrombin III (SEQ ID NO:4), human apoprotein E (SEQ ID NO:5), human angio-associated migratory protein (SEQ ID NO:6), or human amphiregulin (SEQ ID NO:7).

13- 21. (Canceled)

22. (Currently amended) The compound of claim 1, wherein the ~~sialidase domain~~ peptide or protein having sialidase activity comprises a sialidase or an active portion ~~thereof~~ of a sialidase, wherein the active portion retains enzymatic activity and does not comprise the full length enzyme.

23. (Canceled)

24. (Previously presented) The compound of claim 22, wherein the sialidase is at least one viral sialidase, at least one bacterial sialidase, or at least one eukaryotic sialidase.

25-30. (Canceled)

31. (Previously presented) The compound of claim 24, wherein the sialidase is at least one eukaryotic sialidase.

32. (Previously presented) The compound of claim 31, wherein the sialidase is at least one human sialidase.

33. (Previously presented) The compound of claim 32, wherein the human sialidase is the NEU1, NEU3, NEU2, or NEU4 genes.

34. (Currently amended) The compound of claim 33, wherein the sialidase is the NEU2 or NEU4 genes and comprises ~~a sequence of amino acids that is or is substantially homologous to~~ the ~~sequence of amino acids set forth in~~ the amino acid sequence of SEQ ID NO:8 or SEQ ID NO:9.

35-46. (Canceled)

47. (Previously presented) A pharmaceutical formulation comprising the compound of claim 1.

48-49. (Canceled)

50. (Withdrawn) A method for the prevention, prophylaxis or treatment of influenza infection, comprising: applying a therapeutically effective amount of the composition of claim 1 to target cells of a subject.

51-53. (Canceled)

54. (Withdrawn and currently amended) A method of using a sialidase for the prevention, prophylaxis or treatment of infection by a pathogen, comprising:

applying a therapeutically effective amount of the composition of claim ~~23~~ 24 to target cells of a subject.

55. (Canceled)

56. (Withdrawn and currently amended) The method of claim ~~55~~ 54, wherein the sialidase is ~~or is substantially homologous to~~ at least one eukaryotic sialidase.

57. (Withdrawn and currently amended) The method of claim ~~56~~ 54, wherein the subject is a human subject and the sialidase is ~~or is substantially homologous to~~ at least one human sialidase.

58. (Withdrawn and currently amended) The method of claim ~~57~~ 56, wherein the sialidase is ~~or is substantially homologous to~~ the NEU2 or NEU4 genes and comprises a sequence of amino acids that is ~~or is substantially homologous to~~ the sequence of amino acids set forth in SEQ ID NO:8 or SEQ ID NO:9.

59-60. (Canceled)

61. (Previously presented) The compound of claim 24, wherein the sialidase is at least one bacterial sialidase.

62. (Previously presented) The compound of claim 61, wherein the bacterial sialidase is selected from the group consisting of *Vibrio cholerae* sialidase, *Clostridium perfringens* sialidase, *Actinomyces viscosus* sialidase and *Micromonospora viridifaciens* sialidase.

63. (Previously presented) The compound of claim 61, comprising only one bacterial sialidase.

64. (Previously presented) The compound of claim 63, wherein the bacterial sialidase is *Actinomyces viscosus* sialidase.

65. (Currently amended) The compound of claim 1, further comprising at least one peptide linker that links the ~~anchoring domain~~ peptide or protein that binds to a GAG to the ~~sialidase domain~~ peptide or protein having sialidase activity.

66. (Previously presented) The compound of claim 65, wherein the peptide linker comprises at least one glycine residue.

67. (Previously presented) The compound of claim 65, wherein the peptide linker comprises the sequence (GGGGS)n, where n is a whole number from 1 to 20.

68. (Currently amended) The compound of claim 1, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG is N-terminal to ~~a~~ the ~~sialidase domain~~ peptide or protein having sialidase activity.

69. (Currently amended) The compound of claim 1, wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG is C-terminal to ~~a~~ the ~~sialidase domain~~ peptide or protein having sialidase activity.

70. (Currently amended) The compound of claim 1, comprising at least two ~~anchoring domains~~ peptides or proteins that bind to a GAG.

71. (Currently amended) The compound of claim 70, wherein at least one of the ~~anchoring domains~~ peptides or proteins that bind to a GAG is N-terminal to ~~a~~ the ~~sialidase domain~~ peptide or protein having sialidase activity and at least one of the ~~anchoring domains~~ peptides or proteins

that bind to a GAG is C-terminal to ~~a~~ the ~~sialidase domain~~ peptide or protein having sialidase activity.

72. (Previously presented) The pharmaceutical formulation of claim 47 that is formulated as a spray.

73. (Previously presented) The pharmaceutical formulation of claim 47 that is formulated as an inhalant.

74. (Previously presented) The compound of claim 3, wherein the epithelial cell is a respiratory epithelial cell, an adenoid epithelial cell or a bronchial epithelial cell.

75. (Canceled)

76. (Previously presented) The pharmaceutical formulation of claim 47 that is formulated as a suspension, a solution for injection or a solution for oral administration.

77. (Previously presented) The pharmaceutical formulation of claim 47 that is formulated as a solution for eye drops.

78. (Previously presented) The pharmaceutical formulation of claim 47 that is formulated as a cream, salve, gel, or ointment.

79. (Previously presented) The pharmaceutical formulation of claim 47 that is formulated as a tablet, capsule or lozenge.

80. (Previously presented) A delivery system, comprising the pharmaceutical formulation of claim 73 and a device selected from among a nebulizer, an atomizer and a dropper bottle.

81. (Canceled)

82. (Withdrawn and currently amended) The method of claim ~~55~~ 54, wherein the sialidase is ~~or is substantially homologous to~~ at least one bacterial sialidase.

83. (Withdrawn) The method of claim 82, wherein the bacterial sialidase is selected from the group consisting of *Vibrio cholerae* sialidase, *Clostridium perfringens* sialidase, *Actinomyces viscosus* sialidase and *Micromonospora viridifaciens* sialidase.

84. (Withdrawn) The method of claim 83, wherein the bacterial sialidase is *Actinomyces viscosus* sialidase.

85. (Withdrawn) The method of claim 54, wherein the applying is by use of a nasal spray.

86. (Withdrawn) The method of claim 54, wherein the applying is by use of an inhaler.

87. (Withdrawn) The method of claim 54, wherein the applying is by oral administration.

88. (Withdrawn) The method of claim 54, wherein the applying is performed from once to four times a day.

89. (Withdrawn) The method of claim 54, wherein the pathogen is a bacterium.

90. (Withdrawn) The method of claim 54, wherein the pathogen is a virus.

91. (Withdrawn) The method of claim 90, wherein the virus is selected from among influenza, parainfluenza and respiratory syncytial virus.

92. (Withdrawn) The method of claim 91, wherein the virus is influenza virus.

93. (Withdrawn) The method of claim 54, wherein the subject is a human subject or an animal subject.

94. (Currently amended) The compound of claim 12, wherein the ~~sialidase domain~~ peptide or protein having sialidase activity is ~~or is substantially homologous to~~:

a human sialidase selected from among the NEU1, NEU3, NEU2, or NEU4 genes; or

a bacterial sialidase selected from among *Vibrio cholerae* sialidase, *Clostridium perfringens* sialidase, *Actinomyces viscosus* sialidase and *Micromonospora viridifaciens* sialidase.

95. (Currently amended) The compound of claim 1, further comprising ~~an additional domain~~ a moiety selected from among proteins, peptides, carbohydrates, fatty acids, lipids, steroids, nucleotides, nucleotide analogues, nucleic acid molecules, nucleic acid analogues, peptide nucleic acid molecules, organic molecules, and polymers.

96. (Currently amended) The compound of claim 95, wherein the ~~additional domain~~ moiety is a purification ~~domain~~ moiety, a ~~domain~~ moiety that improves the solubility or distribution of the compound, a ~~linking domain~~ linker, a stability-conferring ~~domain~~ moiety, a ~~domain~~ moiety that contributes to the three dimensional structure of the compound, or a ~~domain~~ moiety that increases the size of the compound.

97. (Currently amended) The compound of claim 96, wherein the ~~additional domain~~ moiety is a ~~linking domain~~ linker that links the ~~sialidase~~ peptide or protein having sialidase activity and the ~~anchoring domains~~ peptide or protein that binds to a GAG .

98. (Currently amended) The compound of claim ~~96~~ 97, wherein the ~~additional domain is a linking domain that~~ linker further links chemical ~~moieties~~ entities to the compound.

99. (Currently amended) A polypeptide comprising at least one ~~sialidase domain~~ peptide or protein having sialidase activity that cleaves α(2,3)-Gal and/or α(2,6)-Gal linkages; and

at least one ~~anchoring domain~~ peptide or protein that binds to a glycosaminoglycan (GAG) on the surface of ~~the~~ a target cell.

100. (Currently amended) The polypeptide of claim 99 further comprising a ~~linking domain~~ linker that links ~~a sialidase domain~~ the peptide or protein having sialidase activity to ~~an anchoring domain.~~the peptide or protein that binds to a GAG.

101. (Currently amended) The polypeptide of claim 99 wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG binds heparin or heparan sulfate.

102. (Currently amended) The polypeptide of claim 99 wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG comprises a GAG-binding portion of a naturally-occurring protein.

103. (Previously presented) The polypeptide of claim 102 wherein the naturally-occurring protein is a mammalian protein.

104. (Previously presented) The polypeptide of claim 102 wherein the naturally-occurring protein is a human protein.

105. (Currently amended) The polypeptide of claim 99 wherein the ~~anchoring domain~~ peptide or protein that binds to a GAG comprises the GAG-binding amino acid sequence of human platelet factor 4 (SEQ ID NO:2), human interleukin 8 (SEQ ID NO:3), human antithrombin III (SEQ ID NO:4), human apoprotein E (SEQ ID NO:5), human angio-associated migratory protein (SEQ ID NO:6), or human amphiregulin (SEQ ID NO:7).

106. (Currently amended) The polypeptide of claim 99, wherein the peptide or protein having sialidase activity comprises ~~sialidase is~~ at least one viral sialidase, at least one bacterial sialidase, or at least one eukaryotic sialidase.

107. (Previously presented) The polypeptide of claim 106, wherein the sialidase is at least one eukaryotic sialidase.

108. (Previously presented) The polypeptide of claim 107, wherein the sialidase is at least one human sialidase.

109. (Previously presented) The polypeptide of claim 108, wherein the human sialidase is the NEU1, NEU3, NEU2, or NEU4 genes.

110. (Currently amended) The polypeptide of claim 99 or claim 105 wherein the ~~sialidase domain~~ peptide or protein having sialidase activity comprises all or an enzymatically active portion of a bacterial sialidase selected from among *Vibrio cholerae* sialidase, *Clostridium perfringens* sialidase, *Actinomyces viscosus* sialidase and *Micromonospora viridifaciens* sialidase.

111. (New) A compound as in claim 1 for use in preventing or treating infection by a pathogen.

112. (New) The compound of claim 111, wherein the pathogen is a virus.

113. (New) The compound of claim 112, wherein the virus is an influenza virus.

114. (New) The compound of claim 112, wherein the virus is selected from among parainfluenza and respiratory syncytial virus.